PEACE/WILLISTON
FISH & WILDLIFE
COMPENSATION
PROGRAM

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Peace/williston Fish and Wildlife Compensation Program Annual Report 2000/2001

M. D. Wood and B. G. Blackman
June 2001

PWFWCP Report No. 240

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The Peace/Williston Fish & Wildlife Compensation Program is a cooperative venture of BC Hydro and the provincial fish and wildlife management agencies, supported by funding from BC Hydro. The Program was established to enhance and protect fish and wildlife resources affected by the construction of the W.A.C. Bennett and Peace Canyon dams on the Peace River, and the subsequent creation of the Williston and Dinosaur Reservoirs.

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Website: *www.bchydro.bc.ca/environment/initiatives/pwcp/*

This report has been approved by the Peace/Williston Fish and Wildlife Compensation Program Fish Technical Committee.

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PEACE /WILLISTON FISH AND WILDLIFE COMPENSATION PROGRAM

ANNUAL REPORT 2000/2001

STEERING COMMITTEE:

John Metcalfe (BC Environment) - Chairman
Dave Cattanach (BC Hydro)
Ted Down (BC Fisheries)
Uli Bergmann (BC Hydro)

FISH TECHNICAL COMMITTEE

Nick Baccante (BC Environment) - Chairman
Cindy Powell (BC Hydro)
Bob Westcott (BC Hydro)
Ted Zimmerman (BC Environment)
Ken Ashley (BC Fisheries - Technical Advisor)

WILDLIFE TECHNICAL COMMITTEE

John Elliott (BC Environment) - Chairman
Alan Chan-McLeod (BC Hydro)
Doug Heard (BC Environment)
Ed Hill (BC Hydro)

FISH BIOLOGISTS:

Brian Blackman (BC Hydro) - Senior Biologist
Arne Langston (BC Hydro)
Randy Zemlak (BC Hydro)

WILDLIFE BIOLOGISTS:

Mari Wood (BC Hydro) - Senior Biologist
Fraser Corbould (BC Hydro)

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PROGRAM ADMINISTRATION

Membership on the Steering Committee (SC) changed this year with Uli Bergmann replacing Ron Fernandas as the BC Hydro (BCH) representative from Power Supply in Hudson's Hope. John Metcalfe of BC Environment (BCE) remained the chair of the Steering Committee for his second year. Membership on the Wildlife Technical Committee (WTC) remained the same as the previous fiscal, however, the chairmanship, previously held by John Elliott (BCE), has been handed over to Alan Chan-McLeod (BCH). Nick Baccante remained the chair of the Fish Technical Committee (FTC) for his second year. Cindy Powell replaced Allister McLean as the BCH representative from Power Supply in Burnaby on the FTC.

Fish biologists Brian Blackman, Arne Langston, and Randy Zemlak, and wildlife biologists Mari Wood, and Fraser Corbould, continued as full-time staff responsible for administering, managing, and conducting program projects and activities.

Administrative activities included preparation of the 1999/2000 Annual Report (Wood and Blackman 2000), tracking program expenditures, managing contracts, preparing quarterly reports on program activities, preparing performance review plans, and updating staff safety training. A number of consulting firms and contractors were employed to undertake work on a variety of projects.

PROGRAM PLANNING

The Fish Program held two in-person meetings and three conference calls to discuss the current year's projects and finances, and prepare a budget for 2001/02 for submission to the SC. The Wildlife Program held one in-person meeting and 3 conference calls to do the same. A Strategic Planning Session attended by biologists and members of the FTC, WTC, and SC was held in Hudson's Hope in October. Senior biologists from both the Fish and Wildlife programs attended the annual January SC meeting to present the 2001/02 budget to the SC. A funding proposal for the Ingenika Prescribed Burn was prepared and submitted to the Habitat Conservation Trust Fund (HCTF) for financial assistance for 2001/2002. Informal meetings were held with individuals, consultants, and stakeholder representatives to discuss current and potential projects for the future

PUBLIC CONSULTATION

Program Staff

One of the high points of the year was a three part series on the Limnology of Williston Reservoir, which aired on NTV (Dawson Creek News, a CBC affiliate). There was also local television coverage (CJDC Dawson Creek) of the release of kokanee from the class room kokanee project. Newspaper articles covering Dina Lake #1, Classroom kokanee, kokanee releases, Arctic grayling projects and the volunteers who help with the projects, were carried in the Mackenzie Times, Prince George Citizen, Alaska Highway News, and Prince George this Week. Information was provided on Arctic grayling for an article in Wattsnew. Detailed information and feedback was provided on Arctic grayling to the BC Fisheries to develop a species account (endangered species) and brochure, and to the Ft. St. James LRMP to help provide guidelines for forest development planning.

Wildlife biologists delivered several slide-show presentations at a variety of venues this year. A component of the Fisher Habitat Use Project was presented together with results from another provincial fisher study by contractor Rich Weir at the Martes 2000 Symposium in Newfoundland in August. In September, Fraser Corbould also presented an overview of the Fisher Project to the SC and other PWFWCP members in Hudson's Hope. In October, Mari Wood presented preliminary results from the McLeod Grizzly Bear Behaviour Project at the Managing Bears in Forested Environments Conference that was held in Revelstoke. The results were delivered to UNBC Wildlife Ecology students in a lab session which included a presentation on wildlife-capture and radio-telemetry techniques. Three presentations were also delivered at the Northeast BC Wildlife Conference in Chetwynd in February: Wood presented results on both the McLeod Grizzly Bear and 20 Mile Point Stone's Sheep projects. Contractor Rich Weir presented data on fisher rest site ecology including results from PWFWCP's Fisher Habitat Use Project.

Poster sessions were also presented on the Fisher Project (Martes 2000 Symposium) and the 20-Mile Point Stone's Sheep Project (Northern Wild Sheep and Goat Symposium in Whitehorse in May). In April, Wood and Corbould attended the PWFWCP display booth at the annual BC Wildlife Federation convention in Prince George. In March, Wood manned the booth at the Guide-Outfitters Association convention in Victoria. The PWFWCP donated half the cost of a custom-made saddle to GOABC, and donated a Live Sheep Capture excursion to the GOABC auction, which raised $2,500 for GOABC. Wood also organised a wildlife identification contest for GOABC members.

Press releases were issued on Rocky Marsh wetland enhancement activities (June) and the McLeod Lake Grizzly Bear Behaviour Project (January), and an article on the Fisher Habitat Use project appeared in FRBC's newsletter (April). The PG Citizen and PG This Week also conducted interviews and prepared news releases on the McLeod Bear project. CBC radio prepared a radio segment on the McLeod Bear project. Video film footage of the capture and examination of grizzly bears (McLeod Bear project), Stone's sheep (20 Mile Point Stone's Sheep project), and wolves (Neonatal Ungulate Selection project) was also obtained throughout the year. Grizzly bear capture footage was used by CKPG-TV to produce a news story about the project. In December, the PWFWCP received a Heritage Sponsor award from Ducks Unlimited for our work on the Rocky Marsh Wetland Enhancement project. A detailed booklet "Fish and Wildlife Species List" listing all the fish and wildlife species present in the PWFWCP program area (including habitats used and seasonal abundance) was produced.

The PWFWCP and specific fish and wildlife projects were discussed through informal meetings and talks with industry representatives, club members, guide outfitters, trappers, contractors, students, tourists, and other government agencies. Detailed project information and technical reports were also discussed with, and disseminated to consultants, biologists, and researchers.

Program biologists also contributed to PWFWCP public consultation activities handled by BC Hydro's Public Affairs department (see below) including drafting and editing projects articles for *Natureline #12* (the PWFWCP's official newsletter), reviewing draft text and layout of the PWFWCP brochure, and drafting periodic Project Update sheets. Options for placement of digital copies of PWFWCP technical reports on the program's website were explored. Biologists also provided input to the development of the 2001/02 Public Consultation Plan.

BC Hydro Public Affairs

Advertisements for the PWFWCP were placed in the 2000/2001, Freshwater Fishing Regulations Synopsis, and Hunting and Trapping Regulations Synopsis. Drafts of Natureline and the Program brochure were completed. Program updates were distributed to stakeholders and letters were sent to stakeholders during special events. Public Affairs personnel also attended the BC Wildlife Convention and investigated changing the name of the program.

FISH PROGRAM

Brian Blackman

2000/2001 PROJECT LIST

Map	Task #	Project	Location
1	00-01	Project Maintenance	Parsnip
2	00-02	Stocking Program	Watershed
3	00-03	Report Writing Previous Years	Office
4	00-04	Classroom Kokanee *	Watershed
5	00-05	Dinosaur Reservoir Creel Survey	Dinosaur
6	00-06	Dinosaur Reservoir Aquatic Plant Transplant	Dinosaur
7	00-07	Arctic Grayling (UBC)	Parsnip
S	00-08	Gething Bull Trout Evaluations	Dinosaur
9	00-09	Williston and Dinosaur Fisheries Resources Catalogue	Watershed
10	00-10	Davis River Bull Trout Utilisation Studies (MELP)	Finlay
12	00-12	Williston Watershed Pygmy Whitefish Studies	Parsnip
13	00-13	Williston Reservoir Limnology	Reservoir
14	00-14	Williston Reservoir Fish Assessment (BC Fisheries)	Reservoir

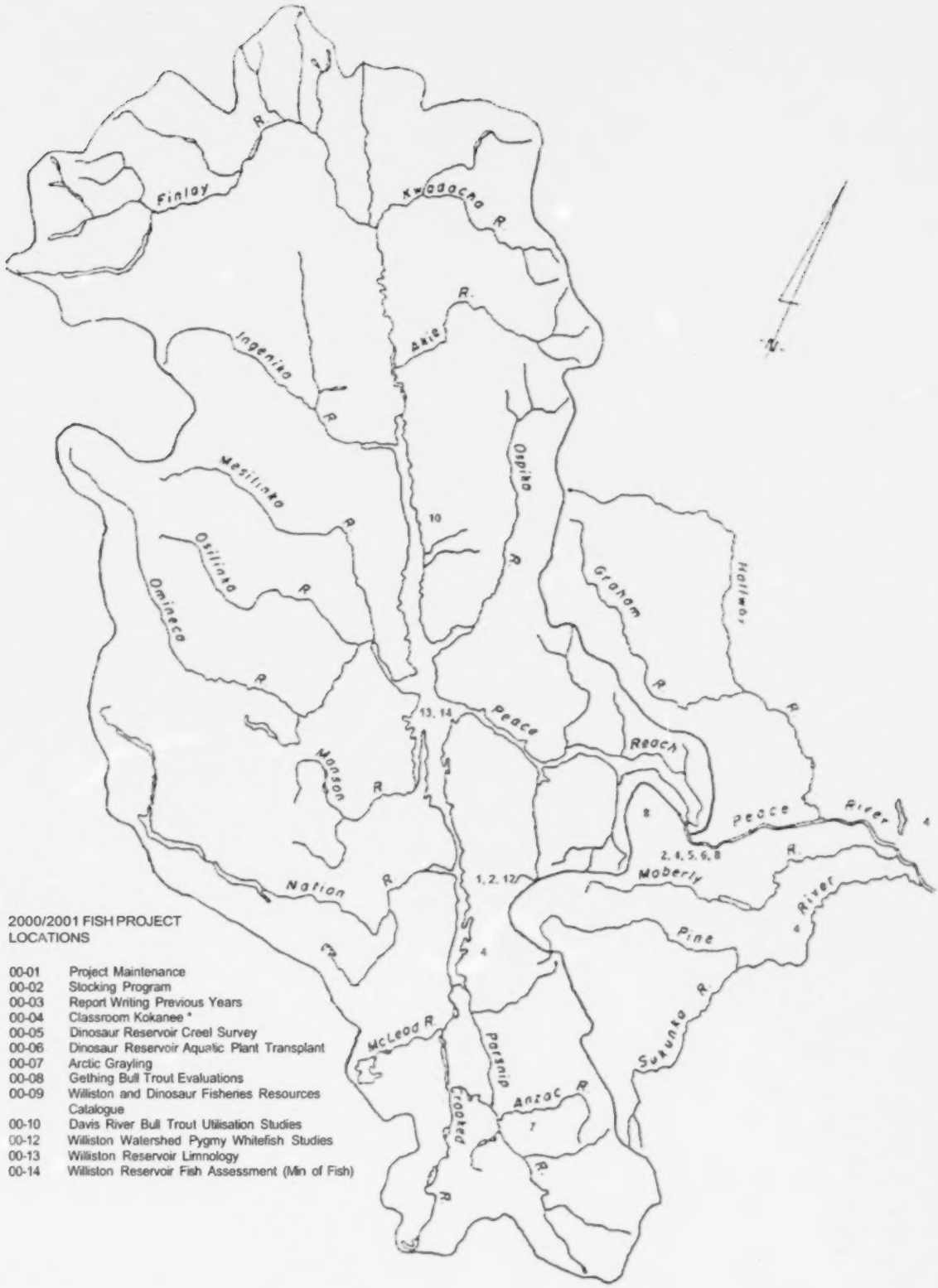
(Co-operative projects with:)

DFO Dept of Fisheries and Oceans, Habitat Conservation Trust Fund, Donahue Forest Products, Fletcher Challenge Canada, Mackenzie Fish and Game Association, Canfor Ltd., BC Hydro office at the W.A.C. Bennett Dam Lions club of Hudson's Hope and the Hudson's Hope Rod and Gun Club.

UBC University of British Columbia - part of this project was graduate student funded by PWFWCP

MELP Ministry of Environment Lands and Parks - funded by PWFWCP

BC Fisheries - joint project funded by PWFWCP



2000/2001 FISH PROJECT LOCATIONS

00-01	Project Maintenance
00-02	Stocking Program
00-03	Report Writing Previous Years
00-04	Classroom Kokanee *
00-05	Dinosaur Reservoir Creel Survey
00-06	Dinosaur Reservoir Aquatic Plant Transplant
00-07	Arctic Grayling
00-08	Gething Bull Trout Evaluations
00-09	Williston and Dinosaur Fisheries Resources Catalogue
00-10	Davis River Bull Trout Utilisation Studies
00-12	Williston Watershed Pygmy Whitefish Studies
00-13	Williston Reservoir Limnology
00-14	Williston Reservoir Fish Assessment (Min of Fish)

PROJECTS

1. PROJECT MAINTENANCE (#00-01)

Objective: To provide maintenance of the Dina Creek and Dina Lake #3 inlet spawning habitat improvement projects and to monitor numbers and locations of returning kokanee and their spawning sites.

2000/01 (Year 5 of ongoing): In Dina Creek the coarse fish barrier was adjusted, some debris was removed, and spawning gravel was added in preparation for the rainbow trout spawners. These activities were carried out with the assistance of local volunteers (Mackenzie Nature Observatory and the Mackenzie Fish and Game Association) and later the road culvert was cleared of debris (beaver activity) again. Project biologists assisted with the Dina Creek Field Day, where local students learn about stream ecology. Spawning kokanee were found at a number of locations in Carbon Creek, and for the first time kokanee (~75) were observed at the mouth of the spawning / rearing channel which we completed in 1996. Unfortunately, access to the channel was blocked by beaver dams, which have inundated roughly 90% of the channel.

2. STOCKING PROGRAM (#00-02)

Objective: To provide funds to cover the costs, to B C Fisheries for the rearing and release of fish for PWFWCP projects.

2000/01 (Year 11 of ongoing): This year 11,000 rainbow trout were released into four small lakes. Dinosaur Reservoir was stocked with 4,640 catchable (204g) and 10,000 large fingerling (46g) rainbow trout, which fish were fin clipped as part of an ongoing evaluation of stocking in the reservoir.

3. REPORT WRITING PREVIOUS YEARS (#00-03)

Objective: To provide staff time and funds for the completion and distributions of reports from previous years.

2000/01 (Year 4 of Ongoing): Report completion status:
a) Radio telemetry studies of Arctic grayling migrations to overwinter, spawning and summer feeding areas of the Parsnip River watershed 1996-97, is under final review; (b) 1997 Arctic grayling habitat utilization studies in the Table and Anzac Rivers - data has been tabulated and given to two separate sources for statistical analysis. The analysis has been completed and preparation of the report is underway; (c) 1998 Arctic grayling Surveys in the Table Anzac and Parsnip rivers underwent multiple reviews and has been approved; (d) A strategic plan for the conservation and restoration of Arctic grayling in the Williston Reservoir Watershed is in final review; (e) Summary of information gathered on Arctic grayling in the Williston Reservoir Watershed to 1999, and a data gap analysis, is in review.; (f) PWFWCP Summary of Fisheries Activities 1988- 1997, has been re written and is in final review; (g) Fisheries Resources of Williston Reservoir 20 yrs after impoundment, has been approved; (h) Notes on the surgical implantation of radio transmitters using clove oil as an anaesthetic, is under review, (i) Williston Reservoir 1989 Creel Report has been revised and is under review; (j) a first draft of the Development of a Premier Northern River Fishery: The Mesilinka River 1992-99, has been completed and reviewed, (k) Stock Assessment of Sabai Lake, has been approved.

4. CLASSROOM KOKANEE (#00-04)

Objective: To assist with a program to raise kokanee in a classroom environment, as an educational tool, in Mackenzie, Hudson's Hope, Dawson Creek and Ft. St. John schools.

2000/01 (Year 5 of ongoing): This project was conducted in conjunction with the local School District, Department of Fisheries and Oceans, Habitat Conservation Trust Fund, Donahue Forest Products, Fletcher Challenge Canada, Mackenzie Fish and Game Association, Canfor Ltd., BC Hydro office at the W.A.C. Bennett Dam, Lions Club of Hudson's Hope, and the Hudson's Hope Rod and Gun Club. In 2000, kokanee reared in classrooms the previous winter were released into local streams, art contest winners were selected and prizes awarded. Equipment was purchased for the Chetwynd schools and DFO provided a refrigeration unit (normal classroom temperatures are too warm for incubation). Unfortunately, eggs were not available this year from Meadow Creek so permits were obtained and eggs from Carbon Creek kokanee were collected and fertilised. The eggs were provided to the schools in Ft. St. John, Hudson's Hope and Chetwynd. No eggs were available for the two Mackenzie schools, so young of the year rainbow trout and yearling brook trout were collected from Dina Creek and provided to the schools for rearing.

5. DINOSAUR RESERVOIR CREEL SURVEY (#00-05)

Objective: To gather angler effort, catch success, and fish growth information from the Dinosaur Reservoir fishery to determine the effectiveness of the present stocking program and to provide baseline data in order to evaluate enhancement activities planned for the reservoir.

2000/01 (Year 2 of 2): In 1999 and in 2000 two sizes (catchable and fingerling) of fin clipped rainbow trout were released into Dinosaur Reservoir. The catchable size rainbow trout accounted for 35% of the rainbow trout catch. Success rates were highest just after the fish were released, but fish from the 1999 releases were still being captured in 2000. All of the marked hatchery fish that were captured were from the large catchables and none of the fingerlings were captured. Angler effort and catch rates were similar to those recorded during the surveys conducted in the 1980's and in 1999. Nearly 30% of the wild rainbow trout sampled were greater than 350g in weight and showed remarkably fast growth (ages 3-5), much fast growth that was expected. The report is in progress.

6. DINOSAUR RESERVOIR AQUATIC PLANT TRANSPLANT (#00-06)

Objective: To examine the potential of establishing aquatic plants in Dinosaur Reservoir. The establishment of aquatic plants should reduce entrainment problems, increase littoral productivity and benefit most fish species found in the reservoir. The year 2000 project was to test plant four species of emergents (2,250 plants) and several species of local submergent plants (250 plants) to determine the if aquatic vegetation can be established in Dinosaur Reservoir.

2000/01 (Year 2 of 3): Over 2000 emergent seedlings were planted in the drawdown zone at Johnson Creek embayment and near the boat launch. These plants, two sedge species and one grass species, were produced from seeds collected from the Peace River floodplain the previous fall. Seeds collected from a third species of local sedge failed to germinate. Four submergent species (three *of Potamogeton* and one *Sparganium)* were collected from Trapping Lake and transplanted to Johnson Creek embayment. Nearly all of the sedge plants were growing well and the grass was still alive at the boat launch in mid September. The emergent plants in Johnson Creek embayment appear to have been heavily grazed by deer, moose and goose, however, the submergent plants failed to show initial growth. They either died or had been grazed as well. Wild sedge seeds were collected for the 2001 program and we will be investigating methods to protect the plants from the local wildlife.

7. ARCTIC GRAYLING (#00-07)

Objective: This years objectives were to: (1) initiate collection of long term, year round stream water temperature data; (2) gather relative abundance and distribution data on juvenile and young of the year Arctic grayling from the Parsnip River; (3) continue adult abundance estimates from index sites in the Table and Anzac rivers; (4) continue to gather information on growth and rearing densities of grayling fry from index sites on the Table and Anzac rivers; (5) complete the Arctic grayling genetic studies.

2000/01 (Year 6 of ongoing): (1) The data from ten thermographs installed in July in the Parsnip River and its tributaries was downloaded in October. (2) Ninety sites over a 50-kilometre section of the Parsnip River were sampled using beach seines. The number of young of the year and one year old grayling captured per kilometre was very similar to the 1998 survey. This methodology will be used as an index of recruitment in these and other systems, but large sample sizes are required because of the highly variable and clumped distributions of the fish. (3) Adult grayling counts in the Table River were comparable to previous years in the four kilometre index site in upper river (127,136, & 123 grayling in 1995, 1998 & 2000 respectively) but were more variable in the mid-river and lower sites. Heavy rains prevented completion of the surveys in the Anzac River. (4) The heavy rains also prevented completion of the fry index sites in the Table and Anzac rivers. (5) The genetic studies have been completed and we have received a draft copy of the thesis paper.

8. GETHING BULL TROUT EVALUATION (#00-08)

Objective: To evaluate the success of the Gething Bull Trout Transplant Project.

2000/01 (Year 2 of 2): In 2000, young of the year bull trout were captured in two of four sites on Gething and Dowling Creeks and rainbow trout were captured at all four sites. The bull trout fry were probably the progeny of the adults transplanted in 1999. The 1999 and 2000 evaluations show the transplanted adults have successfully spawned in Gething Creek. The resultant fry appear to spend two summers in the stream before migrating out. Some bull trout have moved upstream and colonised Wright Lake. A single young of the year fry was captured in Dowling Creek in 1999 indicating that some fry have remained in the stream long enough to become sexually mature and reproduce. No bull trout have been captured in Gaylard Creek, but adults were only taken there to spawn once in 1994. Rainbow trout have moved out of Wright Lake, where they have been stocked since 1991. They are found in high numbers in upper Gething Creek, and are present in Dowling and Gaylard Creeks as well. The rainbow trout in Gaylard are probably a result of stocking by the Peace Canyon Hatchery in 1980's. No estimates have been made of the actual survival rates and numbers of 1+ parr migrating to the reservoir.

9. WILLISTON AND DINOSAUR WATERSHED FISHERIES RESOURCES CATALOGUE (#00-09)

Objective: To catalogue all available historical data on fish stocks from the Williston and Dinosaur watersheds and have it easily accessible through a user friendly P.C. Program.

2000/01 (Year lof 2): The first phase of the project has been completed and distributed to the members of the FTC for comments. This CD ROM program is broken into four categories, History, Maps of the Region, Fish List, and Geological History. The History provides a background of fish presence the area, before and after the construction of the dams. The Maps of the Region section has an area map, which is then broken into 14 major watershed maps. These maps show data collection sites, which are linked to a database containing the information available on that site. The database can also be accessed from a "place name" list. The Fish List provides a list of all species present in the watersheds and a key to identify each species.

Information on species distribution, life history and habitat requirements is also provided. The geological history shows the geological and glacial events that have formed the region, which played an important role inthespeciesdistribution.

10. DAVIS RIVER BULL TROUT UTILISATION STUDY (#00-10)

Objective: To (1) determine the distribution and relative abundance of spawning bull trout in the Finlay Reach tributaries; (2) identify candidate streams for further study; (3) deploy temperature loggers; (4) develop partnerships with post secondary institutions.

2000/01 (Year 2 of 4): This project has evolved from a two year program to look at bull trout spawning site selection in Davis River to a multi year program to establishing index sites on Finlay Reach streams in order to monitor bull trout spawner abundance. This year, potential spawning sites have been identified in Chowika, Pesika, Factor Ross, Pelly and Swannel rivers. Eighteen temperature loggers have been placed in these streams. Fertilised bull trout eggs have been planted at two sites on Davis and one site on the Chowika River to evaluate egg survival rates and development at different sites.

12. WILLISTON RESERVOIR PYGMY WHITEFISH STUDY (#00-12)

Objective: To determine the life history, distribution, and status of Pygmy whitefish in Williston Watershed. The 2000/2001 project was to study Pygmy Whitefish in Dina Lake, a closed system, to better understand its life history and to investigate the relationship (predator prey) between pygmy whitefish and rainbow trout.

2000/01 (Year 1 of 2): Pygmy whitefish were found to inhabit the deep cold (<9°C) regions of the lake, however, they ventured towards the surface in the evening in pursuit of zooplankton *(cyclopoida* in summer and *daphnia* in fall) which represent there main food source. Some fish were captured at depths where oxygen levels were less than 0.3mg l^{-1}. The largest male captured was 103 mm and the largest female was 130 mm. Females were larger than males at the same age and also appear to live longer (4yrs vs 7 yrs.). Both sexes were sexually mature at age two. Females, captured in late October, just prior to spawning, had from 435 to 1012 eggs. It appeared that prior to spawning, the fish made migrations towards shore. A number of techniques were used to capture fish but only fine mesh gill nets were successful.

13. WILLISTON RESERVOIR LIMNOLOGY (# 00-13)

Objective: To provide baseline data to determine the current trophic state of the reservoir and to gather new information on nutrient status in order to estimate the productive capability of the reservoir.

2000/01 (Year 2 of ongoing): There was little variance between basins and years with average concentrations of total dissolved phosphorous of 3-5mg/m^3 and nitrate nitrogen (NO_3-N) of 60-65 mg/m^3. These values suggest that there were no serious nutrient limitations of phytoplankton growth (except in the Finlay Reach in late summer). The pelagic plankton community composition was similar to those found in other oligotrophic B.C. lakes. These microbial food webs with small pico and nano-plankton are less efficient than shorter food webs at transferring carbon up the food chain, which results in reduced fish production. Williston Reservoir was moderately productive after impoundment, however, the nutrients loss through sedimentation, outflow and the loss of littoral carbon production (caused by the drawdown) has resulted in an ultra-oligotrophic production. Primary production is further limited by low light penetration, as a result of turbidity and deep mixing episodes.

14. HYDROACOUSTIC AND TRAWL SURVEY OF WILLISTON RESERVOIR (#00-14)

Objective: To determine of the current species composition and relative abundance of forage fish in the limnetic zone of the reservoir.

2000/01 (Year 2 of 2): Hydroacoustic, trawl, and pelagic gill netting surveys were conducted in late August. Preliminary results of the hydro acoustic and trawl surveys indicate average fish densities were 90, 65, and 45 fish ha^{-1} in the Finlay, Peace, and Parsnip reaches. This preliminary estimate (~9-12 million) is comparable to the 11.2 million fish estimate from the 1988 surveys. The highest densities were found in the upper Finlay Reach and near Clearwater in the Peace Reach. Fish densities were too low to effectively trawl, and despite extensive efforts, only 37 fish were captured. Gillnets, set in the middle of the reservoir on the surface at seven locations in the reservoir captured 679 fish. This data will be used in conjunction with the hydroacoustic data to provide an estimate of the species composition and abundance in the pelagic (open water away from shore or bottom) zone of the reservoir. Tabulation of the data and production of a report is in progress but has not yet been completed. This data does not provide information on the fish populations occupying the nearshore (littoral areas), but could provide an efficient index of pelagic species that can be repeated in future years..

FISH PROGRAM - FINANCIAL SUMMARY

The Fish Program budget for 2000/2001 was $819,035, which included $65,000 carry over from 1999/00. Expenditures during the fiscal year totalled $834,399. Projects accounted for $621,841 or 75 % of the expenditures and 53 % of staff time. Administration costs were $119,948, (14%) which was higher than expected because of increased, staff time commitments (28 %), GIS, and support costs. Planning costs were $59,161 (7%) and Public Consultation costs were $33,449 or 4% of expenditures.

Staff time was 118 days over what had been budgeted. Most of this was consumed by administration, which was 92 days over budget (225 vs 133). Planning was close to projections (124 vs 121) and Public Consultation required 25 staff days, rather than the 10 days budgeted. Overall, projects were close to projections, however, there was some major over-expenditures of time. Pygmy whitefish required 51 more days (85 vs 34) than budgeted and limnology took 46 more days (179 vs 133). Classroom kokanee was 12 days (27 vs 15) over budget but an additional school was added to the project and staff were required to capture eggs and fry because none were available from the hatchery program. These over commitments were offset by a 39 day savings (47 vs 86) in the grayling project (weather prevented completion of the project) and 39 days (17 vs 56) in the reservoir fish assessment, which was conducted by contract rather than program staff.

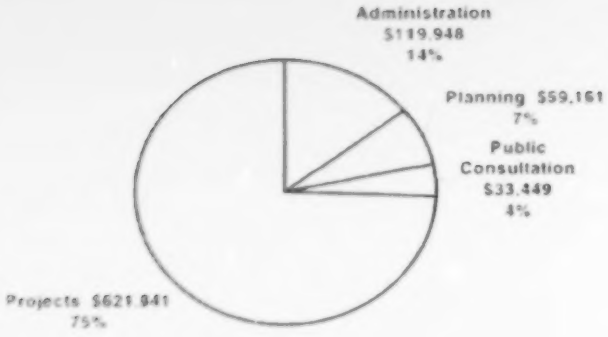


Figure 1. Fish Program expenditures for the 1999/2000 fiscal year.

Table 1. Detailed Fish Program budget expenditures for the 1999/2000 fiscal

COST CATEGORY	TASK #	SPECIFIC PROJECT	PROJECT COSTS	TOTAL EXPENDED	% Expended	% Budgeted
Administration	00 Base 01	Administration	119,948	$119,948	14.4	8.8
Planning	00 base 02	Planning	59161	$59,161	7.1	6.8
Public Consultation	00 Base 03	Public Consultation	33,449	$33,449	4.0	3.2
Projects				$621,841	74.5	81.2
	00-01	Project Maintenance	4,335			
	00-02	Stocking	27,473			
	00-03	Report Writing	11,125			
	00-04	Classroom Kokanee	12,479			
	00-05	Dinosaur Creel Survey	20,023			
	00-06	Dinosaur Aquatic Plants	13,824			
	00-07	Arctic grayling	86,387			
	00-08	Gething BT evaluation	4,845			
	00-09	Fish resource catalogue	31,419			
	00-10	Davis River Bull Trout	54,268			
	00-12	Pygmy Whitefish	60,357			
	00-13	Reservoir Limnology	184,988			
	00-14	Reservoir Fish Assessment	108,494			
		Misc	1,528			
		TOTAL		**$834,399**	**100%**	**100%**

Project Costs: includes operational costs, staff wages and travel, equipment & supplies, and vehicle costs.
Administration: includes staff wages, office rent, BCE administrative support, office supplies, vehicle costs.
Planning: includes staff wages & travel, Technical Committee travel, vehicle costs.
Public Consultation: includes staff wages & travel, vehicle costs, BCH activities (Natureline etc.)
Misc project was primarily time spent on habitat protection & LRMP issues re Arctic grayling

WILDLIFE PROGRAM

Mari D. Wood

2000/01 PROJECT LIST

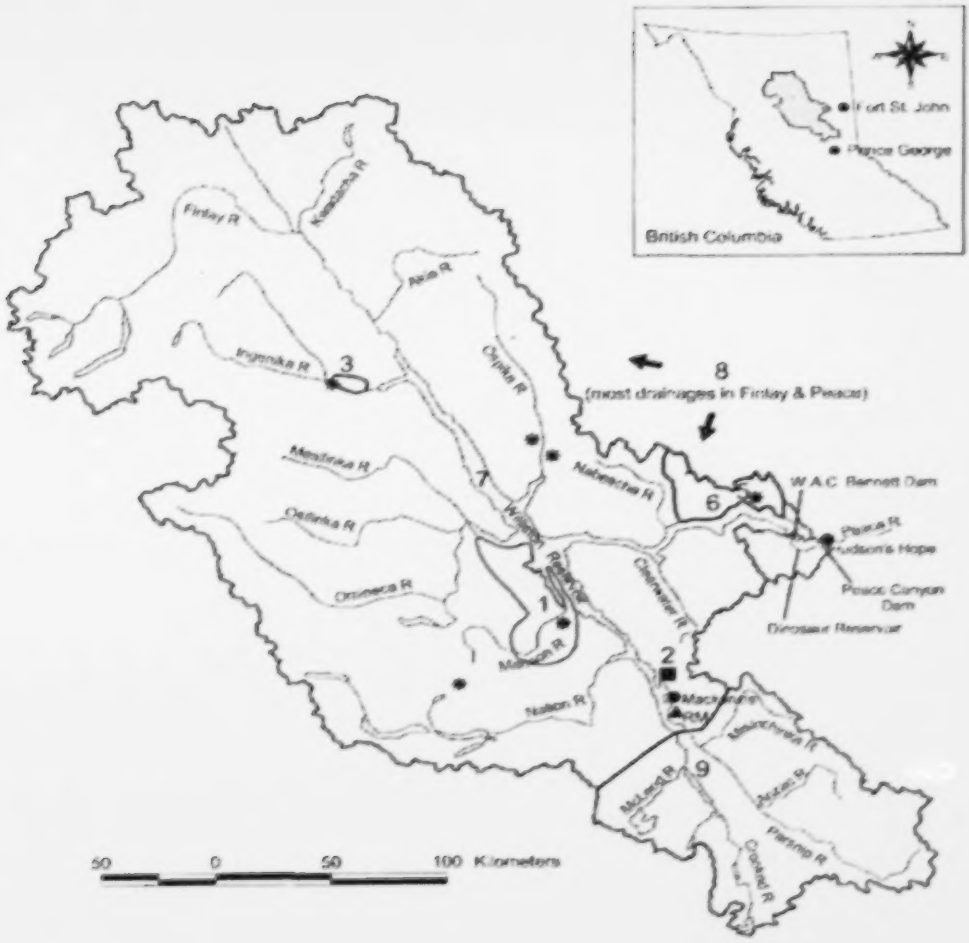
	PROJECT	TASK#	LOCATION
PROJECTS			
1	Fisher Habitat Use Project	00-01	Omineca
2	Mackenzie Migratory Songbird Monitoring (Co-op Project[1])	00-02	Parsnip
3	Ingenika Prescribed Burn	00-03	Finlay
4	Snow Depth Monitoring Stations	00-04	Watershed
5	20 Mile Point Stone's Sheep	00-05	Peace
6	Neonatal Ungulate Selection	00-06	Peace
7	Waterfowl Moulting Surveys	00-07	Watershed
8	Mountain Goat Mineral Lick Identification	00-08	Watershed
9	McLeod Lake Grizzly Bear Behaviour	00-09	Parsnip
10	Cottonwood Tree Enhancement Trial	00-10	Parsnip
11	Data Analyses/Report Writing	00-11	Office
CARRY-OVER PROJECTS FROM 99/00			
12	Rocky Marsh Wetland Enhancement		Parsnip
13	Omineca Mountains Caribou Project Brochure		Parsnip/Finlay
14	Williston Watershed Fish & Wildlife Species List		Watershed

[1] "Co-operative Projects" are administered by other agencies. PWFWCP co-operates on these projects by contributing funding and/or technical expertise.

Abbreviations used for Agencies/Clubs:

Agencies and clubs that are partners on PWFWCP projects are listed in brackets [ ] at the end of each project's objective.

ABIT: Abitibi Mackenzie Operations
BCE: B.C. Environment
CWS: Canadian Wildlife Service
DU: Ducks Unlimited
FRBC: Forest Renewal B.C.
HCTF: Habitat Conservation Trust Fund
MNO: Mackenzie Nature Observatory
MOF: Ministry of Forests
SG: Slocan Mackenzie Operations



PROJECT NAME & NUMBER

00-01 Fisher Habitat Use
00-02 Mackenzie Migratory Bird Monitoring
00-03 Ingenika Prescribed Burn
00-04 Snow Depth Monitoring (* denotes station)
00-05 20 Mile Point Stone's Sheep
00-06 Neonatal Ungulate Selection
00-07 Waterfowl Moulting Survey
00-08 Mtn Goat Mineral Lick Identification
00-09 McLeod Lake Grizzly Bear Behaviour
RM Rocky Marsh Wetland Enhancement

PROJECT SUMMARIES

1. FISHER HABITAT USE PROJECT (#00-01)

Project Objective: To obtain an understanding of fisher ecology and population dynamics in the sub-boreal forests that will lead to the design and implementation of future enhancement and protection activities. [PWFWCP, FRBC, BCE, SG, ABIT]

2000/01 (Year 5 of 5): In the final year of fieldwork, a contractor continued to conduct fieldwork and project reporting. Up to 6 fishers were monitored by ground and air until fall 2000 to determine movements and seasonal habitat use. Natal den sites were investigated in spring and habitat assessments were conducted during summer. Periodic progress updates were prepared by contractor. Presentations were delivered at the Martes 2000 Symposium in Newfoundland and a wildlife conference in Chetwynd, BC. Two papers (rest sites and home ranges), both incorporating data from Peace/Williston and the only other provincial fisher study, were submitted for publishing in the Martes symposium proceedings. The final 5-year report will be completed in 2001/02.

2. MACKENZIE MIGRATORY BIRD MONITORING (Co-op PROJECT) (#00-02)

Project Objectives: To determine the population status and trends of neotropical migratory songbird populations in the northern Rocky Mountain Trench, and to identify those species that may be at risk from habitat loss and degradation. This is a long-term initiative of the Canadian Wildlife Service to monitor trends of songbird populations throughout North America, to which the PWFWCP contributes annual funding support. [CWS, MNO, PWFWCP, SG, ABIT]

2000/01 (Yr 6 of ongoing): The mist-nets and banding station at Mugaha Marsh were re-established, and a master bander was hired for the fall migration season. Volunteers from the Mackenzie Nature Observatory provided assistance on a full-time basis. Capture and banding took place between mid-July and mid-September. The PWFWCP once again provided funding support for this co-operative project.

3. INGENIKA PRESCRIBED BURN (#00-03)

Project Objectives: To enhance forage for ungulates and bears, and to provide foraging and breeding habitat for many wildlife species that require early seral habitats. [PWFWCP, HCTF, BCE, MoF]

2000/01 (ongoing): Pre-burn planning meetings were held with MoF and BCE, and site inspections were conducted. A cat guard required by the Forest Service was created in May, and 75-100 ha (10%) of the area was burned. Infrared scanning of the burn site was conducted to ensure no hot spots remained. A proposal for contingency mop-up funding was re-submitted to HCTF for the 2001/02 fiscal.

4. SNOW DEPTH MONITORING (#00-04)

Project Objectives: To monitor snow depth trends at representative sites within the Williston Reservoir watershed that will provide baseline snow depth data and aid in the identification of important ungulate winter ranges. [PWFWCP]

2000/01 (Year 3 of ongoing): Dataloggers from 6 remote weather stations throughout the watershed were collected and downloaded.. Dataloggers were re-established at the same 6 sites in fall 2000: Squawfish Lake,

Manson River, Ingenika River, Ospika River (low and high elevations), and Aylard Creek. Data from the winter of 00/01 will be retrieved and downloaded in the summer of 2001.

5. 20 MILE POINT STONE'S SHEEP (#00-05)

Project Objectives: To define the winter tick infestation in Stone's sheep wintering at low elevation on 20 Mile Point, north side of the Peace Arm, including determination of the cause of the problem, and the extent to which it affects herd health and productivity. [PWFWCP, BCE Victoria]

2000/01 (Year 3 of 4): A contract to monitor the movements of 10 radio-collared Stone's sheep captured in 1999 and 2000 was awarded; aerial telemetry was conducted throughout the year with a focus on range and habitat use during spring and fall. Production of lambs by collared ewes was monitored in June, and surveys to monitor lamb survival were conducted in December and March. Four of 5 low elevation sheep, and 2 of 5 high elevation sheep were re-captured and re-examined for winter tick loads in March 2001. Ten additional Stone's sheep wintering on low elevation ranges adjacent to the reservoir were captured and radio-collared for subsequent monitoring. Capture of low elevation sheep from 20 Mile Point and Branham Slide was conducted with the use of many different volunteers. A progress report covering Years 1 and 2 was drafted.

6. NEONATAL UNGULATE SELECTION (#00-06)

Objectives: To identify neonatal ungulate selection by wolves in the north Peace Arm multi-prey system. [PWFWCP]

2000/01 (Year 2 of 4): A contract to monitor 5 radio-collared wolves captured in winter 2000 was awarded. Wolves were monitored biweekly throughout the spring/summer denning period, then monthly thereafter if they remained within the north Peace Arm study area. One wolf slipped its collar in spring, while another was not located since capture. None of the remaining 3 wolves remained in the study area: one migrated west to Mackenzie, one was located in the Carbon drainage, and one denned in the Clearwater drainage. The Clearwater den and an incidentally observed den near 20 Mile Point were investigated in August 2000; scats were collected and frozen for future analyses. Between February and April 2001, 7 additional wolves were captured by net-gunning over bait sites established on the Williston Reservoir; all wolves were radio-collared. One of the 7 wolves was shot 2 weeks after capture during a legal hunting season.

7. WATERFOWL MOULTING SURVEY (#00-07)

Objectives: To identify sites along the foreshore of the Williston Reservoir used by moulting and brood-rearing Canada geese in order to direct future enhancement and protection activities. [PWFWCP]

2000/01 (Year 2 of 2): In July, the second year of surveys along the foreshore of the Finlay and Parsnip Reaches were conducted. Surveys were conducted on the same two dates as in 1999, however, reservoir water levels were different. Similar numbers of Canada geese (~1,000) were observed as in the previous year. A 2-year project report will be completed in 2001/02.

8. MOUNTAIN GOAT MINERAL LICK IDENTIFICATION (#00-08)

Project Objectives: To identify mineral licks used by mountain goats within the Williston watershed, and to bring mineral lick locations to the attention of resource managers and recommend the establishment of Wildlife Habitat Areas (WHA's), Wildlife Habitat Features (WHF's), or harvesting deferrals. [PWFWCP]

2000/01 (Year 1 of 1): Clay banks in several drainages throughout the watershed were identified on forest cover maps, and mineral lick locations obtained from Tsay Keh Dene members were evaluated. Helicopter surveys of all drainages within mountain goat range west and east of the Finlay Arm of Williston Reservoir, and along the Clearwater River, were conducted. Two new mineral licks were identified in Thane Creek and Polaris Creek, both west of the Finlay Arm. Four mineral lick complexes identified in the Ospika River drainage in 1999 were also revisited, and their main forested access trails were mapped. Three mineral licks (2 in Ospika, 1 in Thane Creek) were selected as potential Wildlife Habitat Areas, and proposals were initiated.

9. MCLEOD LAKE GRIZZLY BEAR BEHAVIOUR (#00-09)

Objectives: To classify the behaviour of individual grizzly bears (and by extension, the behaviour by age, sex, and reproductive status), into bears that become a threat to humans after closure of a landfill, and bears that do not. To assist with improving the decisions made by the Conservation Officer Service (COS) of when and which bears to remove from landfill sites, and which bears to ignore and let live.

2000/01 (Year 1 of 3): Snares and culvert traps were established at the McLeod Lake landfill and monitored between late April and late May 2000. Six bears were captured in spring and radio-tagged for subsequent monitoring. Trapping in the landfill was conducted again between August and October 2000; 7 new grizzly bears were captured, 6 of which were radio-tagged. Movements and habitat use of radio-tagged bears were monitored by fixed-wing aircraft every 1.5 weeks during May and June, and weekly between July and early December. Use of the landfill by radio-tagged bears was monitored by a remote radio-telemetry datalogger that was established at the landfill in May. Habitat investigations at selected aircraft-identified telemetry locations were conducted between July and September. Den sites for all 12 radio-tagged grizzly bears were identified and mapped. An oral presentation on the project was delivered at the Managing Bears in Forested Environments Conference in Revelstoke, BC.

10. COTTONWOOD TREE ENHANCEMENT TRIAL (#00-10)

Objectives: To develop enhancement methods to increase the suitability of mature cottonwood trees for secondary cavity-using wildlife.

2000/01 (Year 1 of 1): This project was deferred to 2001/02 due to safety issues relating to project activities and staff time constraints.

11. DATA ANALYSES/REPORT WRITING (#00-11)

Objectives: To analyse data and complete reports from previous fiscal projects.

2000/01 (Year 1 of ongoing): A number of reports from *previous* projects or inventories were drafted and/or completed in 00/01 (reports on *current* projects are discussed under project summaries elsewhere in this document):

- 1999 Winter Moose Inventory *(completed)*
- 1999 Wolverine Caribou Inventory *(completed)*
- 1999 Akie Caribou Inventory *(completed as part of Slocan caribou report)*
- Ingenika Elk Monitoring (1996-99) and Inventory (2000) report *(completed)*
- 2000 Winter Open-Water/Waterfowl Survey *(completed)*
- 2000 Peace Arm Elk Survey *(drafted)*

CARRY-OVER PROJECTS FROM 99/00

12. ROCKY MARSH WETLAND ENHANCEMENT

Project Objectives: To conserve and enhance the Rocky Marsh wetland area near Mackenzie for waterfowl, aquatic furbearers, and other wildlife species that rely on wetland habitats, by providing secure water levels and increasing waterfowl breeding and rearing habitat. [PWFWCP, DU, numerous Mackenzie community groups]

2000/01 (Yr 4 of 4): Sign text and layout was composed in co-operation with DU, and the sign was erected at the site. Highway directional signs were also established. A nature trail and boardwalk were established with the assistance of Mackenzie Cadets volunteers. A final project report was prepared by DU.

13. OMINECA MOUNTAINS CARIBOU PROJECT BROCHURE

Objectives: To design and develop a brochure detailing the PWFWCP's six-year study of woodland caribou in the Chase and Wolverine Caribou Herds, west of the Williston Reservoir. [PWFWCP]

2000/01 (Yr 2 of 2): A brochure detailing the Omineca Mountains Caribou Study was drafted and reviewed. Production of the brochure is scheduled for 2001/02.

14. WILLISTON WATERSHED FISH AND WILDLIFE SPECIES LIST

Objectives: To design and develop a pamphlet/booklet listing all the fish and wildlife species found in the Williston Reservoir watershed. [PWFWCP]

2000/01 (Yr 2 of 2): Final reviews of the Fish and Wildlife Species List content and layout were completed. Cover design and printing was completed in 2000.

WILDLIFE PROGRAM - FINANCIAL SUMMARY

The annual Wildlife Program budget in 2000/01 was $560,130, plus $71,725 in carry-over funds from the previous 1999/00 fiscal, resulting in a total annual budget of $631,855. Expenditures in the 2000/01 fiscal year amounted to $658,598 of which 77% ($512,917) was used to conduct wildlife research, enhancement, and evaluation projects (Figure 2, Table 2). An additional $30,650 from 2000/01 was carried over to 2001/02 for completion of deferred portions of some projects.

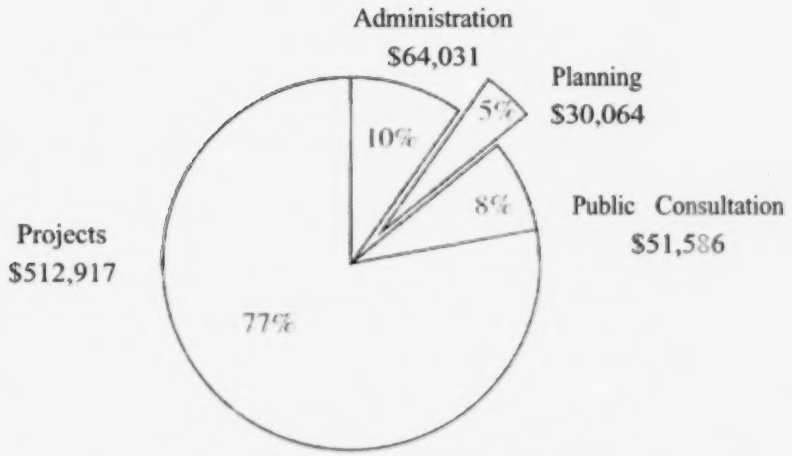


Figure 2. Wildlife Program expenditures in the 2000/01 fiscal year.

Table 2. Detailed Wildlife Program budget expenditures for the 2000/01 fiscal.

COST CATEGORY	TASK #	SPECIFIC PROJECT	PROJECT COSTS[1]	TOTAL EXPENDED	% Expended	% Budgeted
Administration[2]	00-B1	Base Costs	64,031	$64,031	10%	9%
Planning[3]	00-B2	Base Costs	30,064	$30,064	5%	6%
Public Consultation	00-B3	Base Costs[4]	35,837			
		Omineca Caribou Brochure[3]	8,692			
		Fish and Wildlife Species List[5]	7,057	$51,586	8%	4%
Projects	00-01	Fisher Habitat Use Project	112,820			
	00-02	Mackenzie Migratory Bird (Co-op)	11			
	00-03	Ingenika Prescribed Burn	62,235			
	00-04	Snow Depth Monitoring	15,932			
	00-05	20 Mile Point Stone's Sheep	78,622			
	00-06	Neonatal Ungulate Status	46,289			
	00-07	Waterfowl Moulting Survey	21,013			
	00-08	Ospika Goat Mineral Lick Use	25,744			
	00-09	McLeod Lake Grizzly Project	125,642			
	00-10	Cottonwood Tree Enhancement	0			
	00-11	Data Analyses/Report Writing	11,720			
		Rocky Marsh Wetland Enhance[5]	6,688			
	n/a	Other[6]	6,200	$512,917	77%	81%
TOTAL				**$658,598**	**100%**	**100%**

[1] Project Costs: includes operational costs, staff wages and travel, equipment & supplies, and vehicle costs.
[2] Administration: includes staff wages, office rent, BCE administrative support, office supplies, vehicle costs.
[3] Planning: includes staff wages & travel, Technical Committee travel, vehicle costs.
[4] Base Costs - Public Consultation: includes staff wages & travel, vehicle costs, BCH activities (Natureline etc.)
[5] Carry-over: projects carried-over from the 2000/01 fiscal year.
[6] Other: includes input to protection/management activities, maintenance of collar database, and non-PW projects.